

## Post-Katrina Asthma in the Children of New Orleans, with Patricia Chulada

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New Orleans is already known as a hot, moist place—ideal growing conditions for mold. Now factor in Hurricane Katrina, which hit the city in August of 2005, leaving behind even more indoor mold and other asthma-causing allergens. Host Ashley Ahearn talks with Patricia Chulada about research to study and improve post-Katrina asthma symptoms in the children of New Orleans.

**AHEARN:** It's *The Researcher's Perspective*. I'm Ashley Ahearn.

New Orleans is already known as a hot, moist place—ideal growing conditions for mold.

Indoor mold may raise the risk of allergies and asthma. Kids in New Orleans have higher rates of asthma than kids in other cities.<sup>1</sup> Now factor in Hurricane Katrina, which hit the city in August of 2005, leaving behind extensive indoor mold and other allergens.

Scientists at the National Institute of Environmental Health Sciences, Tulane, Louisiana State University, and the New Orleans Health Department saw post-Katrina New Orleans as an unprecedented opportunity to study links between these exposures and childhood asthma symptoms. At the same time, they hoped to help these children using a new kind of asthma counselor program.

Joining me by phone to talk about the research is Dr. Patricia Chulada. She worked with the National Institute of Environmental Health Sciences as a lead researcher on the HEAL study—short for Head-off Environmental Asthma in Louisiana.<sup>2,3,4</sup> She's now an epidemiological researcher at the research corporation Westat.

Hi, Dr. Chulada.

**CHULADA:** Hello.

**AHEARN:** You were conducting research in a disaster zone. Tell me about the HEAL study, and how was it set up? How many participants did you have?

**CHULADA:** Well, we had several goals in mind. The first goal was to look at post-Katrina exposures to characterize the exposures and then test for associations between these exposures and children's asthma symptoms. And at the same time we wanted to help the children by implementing a specialized or a hybrid-type asthma counselor program.

**AHEARN:** How many study participants did you have?

**CHULADA:** We had almost 200 participants.

**AHEARN:** And how did you find these participants, enroll them, and track them in a disaster zone?

**CHULADA:** All the participants were recruited through the school systems in New Orleans and some of the surrounding parishes in New Orleans. We pretty much targeted the areas that had a lot of flooding from post-Katrina flooding, and we actually went into the school systems and distributed letters to the students that they would take home and then give to their parents, and it told their parents a little bit about the HEAL study and asked the parents if their children had any asthma symptoms and if so, if they would be interested in participating in a research study about childhood asthma.

And then the children would bring the letters back and give the letters to us, and then we'd screen people and bring these children in for clinical evaluation to determine if they met the criteria for the study.

**AHEARN:** And you were trying to better understand how mold connects with childhood asthma, so what kind of data did you collect to do that? You were visiting homes as well as, you know, looking at these children in clinic.

**CHULADA:** Right, they had a pretty extensive clinical evaluation, and then we did two different things after that. We actually had environmental teams or environmental scientists go into their homes and collect samples. These samples were air samples and then also dust samples. And then we took these samples back to the laboratory, and we analyzed them for mold, and we also analyzed them for a lot of other allergens—things such as cockroach allergens, dust mites. We looked at specific molds like *Alternaria*. We looked at microbes and microbe by-products and mold by-products. So we actually tested these samples for a lot of different things that could be triggers for childhood asthma.

**AHEARN:** So Dr. Chulada, what would you say are the major findings of your research?

**CHULADA:** First of all, we found with the children, when we did the baseline clinical examination, we found that they were a highly symptomatic population. They actually had higher levels of asthma symptoms compared to children in previous inner-city asthma studies. So that was a significant finding. But the surprising environmental finding was that in their homes they had relatively low levels of mold and other allergens that we tested for in the environmental samples. So it kind of didn't mesh: They were more symptomatic than other childhood study populations, but they actually had lower levels of environmental exposures.

**AHEARN:** That's surprising. I would have expected that a major moisture event, a major storm like Hurricane Katrina, would have lent itself to increased mold conditions and therefore more problems with asthma.

**CHULADA:** One of the things that we're looking at—we don't have the data analyzed for this yet—but stress is also a trigger for asthma, and we collected a lot of data to see if these children were under a lot of psychological stress because of the storm. So their higher symptoms could have been due to a number of different things, and it probably was a combination of factors. It was probably a combination of the environmental triggers that they were exposed to, and it was probably partly due to the stress that they were under and also partly due to the fact that a lot of the health-care workers and physicians also left the area as well. So for the children that stayed they didn't have routine medical care, and a lot of studies have shown that routine medical care or continuous medical care is extremely important for children that have chronic conditions such as asthma.

**AHEARN:** Dr. Chulada, what does “asthma morbidity” mean, in the context of your research?

**CHULADA:** What the asthma morbidity is, it's actually a measurement of the number of days that the children had symptoms in the previous two weeks. So for example, when we interviewed the children or when we did the physical exam of the children we asked their caretakers or their parents, ‘How many times over the last two weeks did your children have symptoms?’ And the symptoms were how many times did they have wheezing fits or coughing fits or how many times did they have interrupted sleep from the asthma symptoms or how many times did they have to slow their activities due to their asthma symptoms. And we counted up the number of days that these events occurred, and that's what we called our morbidity measurements. But we also looked at things like the number of times they used their inhalers over the last month, and we also looked at things like how many times did they have to go to the emergency room because of asthma or how many times did they have to have an unscheduled clinic visit because of their asthma.

**AHEARN:** Now tell me about the counseling work that you and your team did in the course of the study and how that affected the morbidity, asthma morbidity incidence.

**CHULADA:** What we found out was children were highly morbid in the HEAL study, so over the last two weeks they had actually averaged about 7 days of symptoms over a 14-day period. These children then received asthma counseling for a year period or about a year period, and the asthma counselor did two things in the HEAL study. This was a hybrid unique asthma counseling program. So the asthma counselors did traditional case management for these children, which is where they make sure that the children have a doctor, that they're routinely seeing their doctors. They make sure that the children are receiving appropriate medications and that their caregivers know how to use their medications, and then they also do things like to make sure the caregivers are in constant communication with the physicians, and they educate the caregivers on communicating with the physicians.

But the other thing our asthma counselors did, too, was they actually went into the families' homes, the homes of the children, and they counseled the caregivers on how to

remediate or how to reduce the specific exposures that the children were allergic to that they also found in their homes.

So for example, if one, if the environmental team that went in and collected all these samples found out that there was a high level of cockroaches in the home and then during the physical exam we found out that the children were highly allergic to cockroaches from their skin testing, the asthma counselors had that information when they went into the children's home, and then they actually showed the caregivers how to reduce the cockroach population or the cockroaches in their homes so they would reduce that asthma trigger for the children.

**AHEARN:** And what kind of results did you see in these children?

**CHULADA:** So over the one-year period we found that the children's asthma symptoms had been reduced by about 50%, so it was quite a dramatic reduction in childhood asthma symptoms due to the asthma counseling. We were very pleased with the results.

**AHEARN:** What did you hear from the study participants, the caregivers of these kids, and how did they respond to the research you were doing?

**CHULADA:** This was a pretty intense study<sup>5</sup> for the participants or for the caregivers, and one thing that we saw with these caregivers was that the compliance rate or the rate where the caregivers completed all these different activities was very high. These caregivers truly wanted to be in the study, and they truly wanted to help their children or try to help their children reduce their asthma symptoms.

**AHEARN:** What questions remain for you now, and what do you hope to follow up on in the future?

**CHULADA:** It would be nice if we were able to follow these children to find out if the effects of the asthma counseling were long term. We would have liked to also done some more environmental sampling, to be able to go in another year later and to see if these exposures were still reduced in the homes.

**AHEARN:** Dr. Chulada, thanks so much for joining me.

**CHULADA:** Thank you.

**AHEARN:** Dr. Patricia Chulada was a lead researcher on the HEAL study and is now an epidemiological researcher at the research corporation Westat.

And that's *The Researcher's Perspective*. I'm Ashley Ahearn. Thanks for downloading!

**Ashley Ahearn**, host of *The Researcher's Perspective*, has been a producer and reporter for National Public Radio and an Annenberg Fellow at the University of Southern California specializing in science journalism.

## References and Notes

<sup>1</sup> Mvula M, et al. Prevalence of asthma and asthma-like symptoms in inner-city schoolchildren. *J Asthma* 42(1):9–16 (2005); doi:10.1081/JAS-200044746.

<sup>2</sup> Chulada P, et al. The Head-off Environmental Asthma in Louisiana (HEAL) study—methods and study population. *Environ Health Perspect*; doi:10.1289/ehp.1104239 [online 15 August 2012].

<sup>3</sup> Mitchell H, et al. Implementation of evidence-based asthma interventions in post-Katrina New Orleans: The Head-off Environmental Asthma in Louisiana (HEAL) study. *Environ Health Perspect*; doi:10.1289/ehp.1104242 [online 15 August 2012].

<sup>4</sup> Grimsley, L. Faye. Indoor environmental exposures for children with asthma enrolled in the HEAL study, post-Katrina New Orleans. *Environ Health Perspect*; doi:10.1289/ehp.1104840 [online 15 August 2012].

<sup>5</sup> Over the course of one year participants and caregivers were involved in two clinical evaluations, three home environmental evaluations, quarterly telephone calls to assess the children's asthma morbidity, and multiple surveys.